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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,029	01/20/2004	Hideki Sugiura	246918US	1184

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EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/759,029	SUGIURA ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-18* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/16/04;5/21/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Applicants' election with traverse of Group I, claims 1-9 and 11-18, in the reply filed on Sep. 7, 2005, is acknowledged. The traversal is on the ground(s) that the office "has not carried forward its burden of proof to establish distinctness." Applicants further assert that "the claims of the present invention would appear to be part of an overlapping search."

This is not found persuasive. As set forth in the restriction requirement, the examiner has provided reasons as to why the toner in Group I is patentably distinct from the method of making in Group II. Applicants have not specifically indicated the errors in the restriction or specifically articulated why the reasons for restriction are inadequate. In addition, applicants have not provided any reasons why the toner in Group I and the method of making in Group II are not patentably distinct, nor have they stated on the record that the inventions of the two groups are obvious variations of each other.

Moreover, as set forth in the restriction requirement, the search for the toner in Group I and the search for the method of making in Group II are not co-extensive. A search for the toner does not require a search in the method subclass 430/137.16 or in the other method subclasses 430/137.1 and 430/137.15. Nor does a search for the method in Group II require a search in the

toner subclass 430/110.3. The distinct searches and the distinct issues of patentability establish the burden on the Office.

The requirement is still deemed proper and is therefore made FINAL.

2. Claim 10 has been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicants timely traversed the restriction (election) requirement in the reply filed on Sep. 7, 2005.

3. The US patents listed on the "List of related cases" in the Information Disclosure Statements (IDS) filed on Apr. 16, 2004, have been crossed out by the examiner because the references are already listed on the form PTO-1449 filed on Apr. 16, 2004.

The examiner has considered only the material submitted by applicants, i.e., copies of the originally filed claims, abstracts, and figures of the US applications listed in the "List of related cases" filed in the IDS on Apr. 16, 2004.

4. The disclosure is objected to because of the following informalities:

(1) The use of trademarks, e.g., Coulter counter [sic: COULTER COUNTER] at page 12, line 23, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

(2) In example 1, the specification discloses two different sets of process steps after filtering the dispersion slurry 1 to arrive at toner 1. See the first process steps at page 46, lines 10-23, and the second process steps at page 46, line 24, to page 47, line 14. It is not clear what process steps are used to obtain toner 1.

Appropriate correction is required.

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

(1) The entire recitation in claim 14 lacks antecedent basis in the specification. See pages 30-37, of the specification, which discloses a method of making a toner that comprises five process steps, where the process limitations recited in instant claim 14 are a subset of the process step (4). The method recited in instant claim 14 is broader than the method disclosed in the specification, because it includes methods that do not comprise the process steps (1) through (5) disclosed in the instant specification.

(2) In claim 17, the recitation, "a latent image bearer," lacks antecedent basis in the specification. See page 40, line 9, of the specification, which disclose a photoreceptor. The term "latent image bearer" is broader than the disclosed photoreceptor because it includes an image bearer that is not a photoreceptor, such as an electrographic dielectric material.

6. The examiner notes that the following terms recited in the instant claims are defined by the instant specification as:

(1) The "surface roughness of between 1 and 30 nm" is labeled by the specification as "Ra." See the instant specification, page 5, lines 4-5, and page 6, line 9. The specification at page 7, lines 1-8, discloses that "the surface roughness Ra is defined by a three-dimensional average roughness

against a central surface, i.e., volumes of concavities and convexities separated by this flat surface are equal, and represented by . . . formula (I) [disclosed at page 7, lines 5-8]."

(2) The "standard deviation of the surface roughness of between 10 and 90 nm" is defined by the instant specification as the "standard deviation RMS," "a standard deviation of z-values of all the data points" and represented by formula (II) disclosed at page 7, lines 12-16. Instant specification, page 7, lines 9-16.

(3) The term "average circularity" is defined by the instant specification as the average of "the peripheral length of a circle having an area equivalent to that of a projected image optically detected . . . divided by an actual peripheral length of the toner particle." Instant specification, page 10, lines 21-24.

(4) The "shape factor of between 100 to 140" is defined by the instant specification as a SF-2 shape factor, which is defined as the "square of a peripheral length of an image projected on a two-dimensional flat surface (PERI) . . . divided by an area of the image (AREA) and multiplied by $100\pi/4$." See the instant specification, page 132, lines 13-26.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 is indefinite in the phrase "comprises one of the two-component developer according to claim 1 and the one-component developer according to Claim 16" (emphasis added) because it is not clear whether the claim requires the presence of both the two-component developer and the one-component developer, or only the two-component developer or the one-component developer. In colloquial English, the phrase "one of A . . . Z" can be read as being met by any one of A . . . Z. More formally, if only one element is required, one might write "one of A . . . or Z." Or if all elements were required, one might write "one each of A . . . Z." Clarification, supported by specific disclosure in the originally filed specification, is required.

9. The examiner notes that if claim 17 requires the presence of both the two-component developer of claim 15 and the one-component developer of claim 16, claims 17 and 18 would be objectionable under 37 CFR 1.75(c) as being improper multiple dependent claims, because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). The claims would not be further treated on the merits.

10. In the interest of compact prosecution, the examiner has interpreted the claim language in claim 17 as requiring only the presence of either the two-component developer of claim 15 or the one-component developer of claim 16. Rejections based on this interpretation are set forth infra.

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the

> invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1-9 and 11-18 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2004/0115550 A1 (Sugiura), as evidenced by applicants' admissions at page 4, lines 16-20, page 8, line 1, to page 9, line 2, page 11, lines 8-12, page 13, lines 5-12,

page 14, lines 9-13, and Table 2, examples 1-8 and comparative examples 1-6.

Sugiura discloses a two-component developer comprising a magnetic carrier and a toner. The toner comprises toner particles that comprise a polyester binder resin, a colorant, a wax as a releasing agent, and a colorant, and organic resin particles 1 that are present on the surface of the toner particles. The toner particles also comprise hydrophobic silica particles on the surface of toner particles. Paragraphs 0288 and 0293-0308; and example 7 in paragraphs 0324-0326 and in Table 1 at page 24. The organic resin particles 1 comprise a styrene-acrylate copolymer and have a volume average particle size of 110 nm. The organic resin particles 1 meet the compositional limitations recited in instant claim 8 and the particle size limitation of claim 11. The toner in example 7 meets the compositional limitations recited in instant claims 1, 8, 9, and 11. Sugiura in paragraph 0139, lines 9-13, teaches that the resin particles are preferably spherical, which meets the resin particle shape recited in instant claims 12 and 13. The toner particles in example 7 are obtained by a process that comprises the process steps recited in instant claims 7, 11, and 14. See in particular, paragraphs 0300-0301 and 0325-0326. The toner has an average circularity of 0.98. The toner has a

volume average particle diameter (Dv) of 4.5 μm and a ratio of the volume average particle diameter (Dv) to the number average particle diameter (Dn) of 1.13. See Table 1. The average circularity, the Dv, and the ratio Dv/Dn meet the average circularity range, the Dv range, and the ratio Dv/Dn range recited in instant claims 2 and 4, respectively. The toner also has a shape factor SF-2 of 118, which is within the shape factor SF-2 range of 100 to 140 recited in instant claim 6. See Table 1. Sugiura further discloses that the toner can be used as a one-component developer. Paragraph 0193. Sugiura also discloses an image forming apparatus comprising a photoconductor **1**, i.e., a latent image bearer; a charging roller; an exposing device, i.e., an irradiator; a developing device that comprises a two-component developer or one-component developer; a primary transfer device **2** and an intermediate transfer body **4** that transfer the developed image from the photoconductor to a sheet of support paper; and a fixing device **7** to fix the transferred developed image on the sheet of support paper. Fig. 4 and paragraphs 0195 and 0228-0232.

Sugiura does not explicitly disclose that its toner has the surface roughness Ra and the other surface characteristics recited in instant claim 1. Nor does Sugiura disclose that its toner has the ratios of the surface roughness Ra to the volume-

average particle diameter and of the surface roughness Ra to the factor SF-2 recited in instant claims 5 and 6, respectively. Nor does Sugiura disclose that its toner comprises 30% or less of particles having a circularity less than 0.93 recited in instant claim 3.

The instant specification discloses that when the toner particles have the surface roughness Ra and the other surface characteristics, e.g., the convexity density, recited in instant claim 1, the toner has good chargeability, developability, and transferability. Instant specification, page 4, lines 16-20, and Table 2, examples 1-8 and comparative examples 1-6. The instant specification discloses that when the toner particles have a surface roughness Ra of less than 1 nm, the toner is "not frictionally charged well." When the surface roughness Ra is greater than 30 nm, the fluidity and transferability of the toner deteriorates. Instant specification, page 8, lines 1-8, and Table 2, comparative examples 1 and 2. The specification also discloses that when the standard deviation of the surface roughness, RMS, is less than 10 nm, the toner is "not frictionally charged well." When the RMS is greater than 90 nm, the fluidity of the toner deteriorates. Instant specification, page 8, lines 9-17, and Table 2, comparative examples 3, 4, and 6. The specification further discloses that when the number

of the convexity is less than 1 piece per 1 μm, the toner is "not frictionally charged well." When the number of the convexity is greater than 20 pieces per 1 μm, the fluidity and the transferability of the toner deteriorates. Instant specification, page 8, line 18, to page 9, line 2; and Table 2, comparative example 5. The specification discloses that when the ratio of the surface roughness Ra to the volume average particle diameter (Dv) is less than 0.2, the toner chargeability deteriorates. When the ratio of the surface roughness Ra to the Dv is greater than 0.6, the "toner particle is strongly frictionized and tends to be spent." Specification, page 13, lines 5-12. The specification discloses that when the toner particles satisfy the ratio of the surface roughness Ra to the shape factor SF-2 of 0.007 to 0.30 recited in instant claim 6, the toner has good frictional chargeability, developability, and transferability. Specification, page 14, lines 9-13. The specification also discloses that when the ratio of particles having a circularity of less than 0.93 is greater than 30%, "charged speed and level of the resultant toner vary and charged amount distribution thereof widens." Instant specification, page 11, lines 8-12. The instant specification shows that when toners have the surface properties recited in instant claims 1, 5, and 6, and comprise an amount of toner particles having a

circularity less than 0.93 of not greater than 30% as recited in instant claim 3, the toners have: (1) very good to fair cleanability; (2) good to fair charge stability; (3) good image density; (4) good image granularity and sharpness; (5) very good to fair fogging properties; (6) good toner scattering properties; and (7) good to fair environmental blocking resistance. Table 2, examples 1, 2, and 4.

As discussed above, the Sugiura toner meets the compositional and physical limitations, i.e., average circularity, Dv, ratio Dv/Dn, and shape factor SF-2, recited in instant claims 1, 2, 4, 6, 8, 9, and 11. As discussed supra, the Sugiura toner in example 7 is obtained by a process that meets the process limitations recited in instant claims 7, 11, and 14. Sugiura discloses that the toner in example 7 has: (1) good cleanability; (2) fair charge stability; (3) good image density; (4) fair image granularity and sharpness; (5) very good fogging properties; (6) good toner scattering; and (7) very good environmental blocking resistance. Sugiura, Table 2 at page 25, example 7. These are the properties sought by applicants. Accordingly, because the Sugiura toner in example 7 meets the compositional and physical limitations recited in the instant claims and because the Sugiura toner appears to have the toner properties sought by applicants, it is reasonable to presume

that the Sugiura toner in example 7 has the surface roughness Ra properties and the other surface properties recited in instant claims 1, 5, and 6, and comprise an amount of particles having a circularity of less than 0.93 recited in instant claim 3. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

15. US 2003/0180644 A1 (Nanya) was published on Sep. 25, 2003, and has an effective filing date of Mar. 24, 2003, which are both prior to the US filing date of Jan. 20, 2004, of the instant application. The inventive entity of Nanya differs from that of the instant application. Thus, Nanya qualifies as prior art under 35 U.S.C. 102(a) and under 35 U.S.C. 102(e). Accordingly, Nanya qualifies also as prior art under 35 U.S.C. 103(a) and 103(c).

16. Claims 1-5, 7-9, 11, and 14-17 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2003/0180644 A1 (Nanya), as evidenced by applicants' admissions in page 4, lines 16-20, page 8, line 1, to page 9, line 2, page 13, lines 5-12, page 66, lines 17-18, and Table 2, examples 1-8 and comparative examples 1-6 (collectively "applicants' admissions I").

Claims 1-5, 7-9, 11, and 14-17 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nanya, as evidenced by applicants' admissions I.

Nanya discloses a two-component developer comprising a magnetic carrier and a toner. The toner comprises toner particles that a comprise polyester binder resin, a colorant, a wax as a releasing agent, and a colorant, and organic resin particles 1 that are present on the surface of the toner particles. The toner particles also comprise hydrophobic silica particles and hydrophobic titanium particles on the surface of toner particles. Example 1 in paragraphs 0107-0135 and in Table 1-1 at page 13; and paragraphs 0183 and 0204. The organic resin particles 1 comprise a styrene-acrylate copolymer and have a volume average particle size of 100 nm. The organic resin particles 1 meet the compositional limitations recited in instant claim 8 and the particle size limitation of claim 11. The toner in example 1 meets the compositional limitations recited in instant claims 1, 8, 9, and 11. The toner particles are obtained by a process that comprises the process steps recited in instant claims 7, 11, and 14. See in particular, paragraphs 0128-0129. The toner has an average circularity of 0.943. The toner has a volume average particle diameter (Dv)

of 5.99 μm and a ratio of the volume average particle diameter (Dv) to the number average particle diameter (Dn) of 1.05. See Table 1-1. The average circularity, the Dv, and the ratio Dv/Dn meet the average circularity range, the Dv range, and the ratio Dv/Dn range recited in instant claims 2 and 4, respectively. Nanya further teaches that the toner preferably comprises less than 15% by number of particles having a circularity of less than 0.94. Paragraph 0026. The amount of 15% by number of particles having a circularity of less than 0.94 is within the range of 30% or less of toner particles having a circularity of less than 0.93 recited in instant claim 3. Nanya further discloses that the toner can be used as a one-component developer. Paragraph 0105. Nanya discloses the use of the two-component developer comprising the toner of example 1 in the image forming apparatus IMAGIO NEO 450 manufactured by Ricoh, which usually comprises a developing unit. Paragraphs 0002 and 0204.

Nanya does not explicitly disclose that its toner has the surface roughness Ra and the other surface characteristics recited in instant claim 1. Nor does Nanya disclose that its toner has the ratio of the surface roughness Ra to the volume-average particle diameter recited in instant claim 5.

The instant specification discloses that when the toner particles have the surface roughness Ra and the other surface characteristics, e.g., the convexity density, recited in instant claim 1, the toner has good chargeability, developability, and transferability. Instant specification, page 4, lines 16-20, and Table 2, examples 1-8 and comparative examples 1-6. The instant specification discloses that when the toner particles have a surface roughness Ra of less than 1 nm, the toner is "not frictionally charged well." When the surface roughness Ra is greater than 30 nm, the fluidity and transferability of the toner deteriorates. Instant specification, page 8, lines 1-8, and Table 2, comparative examples 1 and 2. In comparative examples 1 and 2, the toners exhibited poor cleanability and charge stability or provided images with poor image density. The specification also discloses that when the standard deviation of the surface roughness, RMS, is less than 10 nm, the toner is "not frictionally charged well." When the RMS is greater than 90 nm, the fluidity of the toner deteriorates. Instant specification, page 8, lines 9-17, and Table 2, comparative examples 3, 4, and 6. In comparative samples 3, 4, and 6, the toners exhibited poor cleanability, and/or poor charge stability, or provided images with poor image density. The specification further discloses that when the number of the

convexity is less than 1 piece per 1 μm, the toner is "not frictionally charged well." When the number of the convexity is greater than 20 pieces per 1 μm, the fluidity and the transferability of the toner deteriorates. Instant specification, page 8, line 18, to page 9, line 2; and Table 2, comparative example 5. The toner in comparative example 5 exhibited fair cleanability, but poor charge stability and provided images with poor image density. The specification discloses that when the ratio of the surface roughness Ra to the volume average particle diameter (Dv) is less than 0.2, the toner chargeability deteriorates. When the ratio of the surface roughness Ra to the Dv is greater than 0.6, the "toner particle is strongly frictionized and tends to be spent." Specification, page 13, lines 5-12, and comparative examples 1, 2, 4, and 6. The instant specification shows that when toners have the surface properties recited in instant claims 1 and 5, the toners exhibit: (1) very good to fair cleanability; (2) good to fair charge stability; (3) good image density; and (4) very good to fair fogging properties. Table 2, examples 1, 2, and 4.

As discussed above, the Nanya toner meets the compositional and physical limitations, i.e., average circularity, Dv, and ratio Dv/Dn, recited in instant claims 1, 2, 4, 8, 9, and 11. As discussed supra, the Nanya toner in example 1 is obtained by

a process that meets the process limitations recited in instant claims 7, 11, and 14. Nanya discloses that the toner in example 1 can be easily removed from photoconductor surfaces in a cleaning step. The toner can be uniformly charged and provides clear images with sharp edges for a long period of service. Paragraphs 0007-0008 and Table 2-2 at page 14, example 1. The Nanya toner in example 1 also provided 100,000 copies with image densities of 1.41, which is labeled as "good" in the instant specification. See Nanya, Table 2-1, example 1; and the instant specification at page 66, lines 17-18. The toner in example 1 exhibited stable chargeability and provided images with no or very little background stain. See Table 2-2. These are the properties sought by applicants. Accordingly, because the Nanya toner in example 1 meets the compositional and physical limitations recited in the instant claims and because the Nanya toner appears to have the toner properties sought by applicants, it is reasonable to presume that the Nanya toner in example 1 has the surface roughness Ra properties and the other surface properties recited in instant claims 1 and 5. The burden is on applicants to prove otherwise. Fitzgerald, supra.

17. US 2003/0152859 A1 (Emoto) was published on Aug. 14, 2003, and has an effective filing date of Nov. 4, 2002, which are both prior to the US filing date of Jan. 20, 2004, of the instant application. The inventive entity of Emoto differs from that of the instant application. Thus, Emoto qualifies as prior art under 35 U.S.C. 102(a) and under 35 U.S.C. 102(e). Accordingly, Emoto qualifies also as prior art under 35 U.S.C. 103(a) and 103(c).

18. Claims 1, 4-7, 9, and 14-18 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2003/052859 A1 (Emoto), as evidenced by applicants' admissions in page 4, lines 16-20, page 8, line 1, to page 9, line 2, page 13, lines 5-12, page 14, lines 9-13, and Table 2, examples 1-8 and comparative examples 1-6 (collectively, "applicants' admissions II").

Claims 1, 4-7, 9, and 14-18 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Emoto, as evidenced by applicants' admissions II.

Emoto discloses a toner that comprises toner particles comprising a polyester binder resin, a colorant, a wax as a releasing agent, and a colorant, and charge controlling

particles that are present on the surface of the toner particles. The toner particles also comprise hydrophobic silica particles and hydrophobic titanium oxide particles on the surface of toner particles. Paragraphs 0127-0130 and example 2 in paragraphs 0131-0135 and in Table 2 at page 14. The toner in example 2 meets the compositional limitations recited in instant claims 1 and 9. The toner has a volume average particle diameter (Dv) of 5.5 μm and a ratio of the volume average particle diameter (Dv) to the number average particle diameter (Dn) of 1.16. The toner has a shape factor SF-2 of 105. See Table 2. The Dv, the ratio Dv/Dn, and the shape factor SF-2 meet the Dv range, the ratio Dv/Dn range, and the shape factor SF-2 range recited in instant claims 4 and 6, respectively. The toner in example 2 is obtained by a process that meets the process step recited in instant claim 7. Emoto further discloses that the toner can be used as a one-component developer or as the toner in a two-component developer comprising a magnetic carrier. Paragraphs 0114-0115. Emoto also discloses an image forming apparatus comprising a photoconductor **1**, i.e., a latent image bearer; a charger **2**; an exposing device **3**, i.e., an irradiator; an image developer that comprises developing rollers **41** and **42**; a transferring unit **5**;

and a fixing device (not shown in Fig. 1). Fig. 1 and paragraphs 0117 and 0210.

Emoto does not explicitly disclose that its toner has the surface roughness Ra and the other surface characteristics recited in instant claim 1. Nor does Emoto disclose that its toner has the ratios of the surface roughness Ra to the volume-average particle diameter and of the surface roughness Ra to the factor SF-2 recited in instant claims 5 and 6, respectively.

The instant specification discloses that when the toner particles have the surface roughness Ra and the other surface characteristics, e.g., the convexity density, recited in instant claim 1, the toner has good chargeability, developability, and transferability. Instant specification, page 4, lines 16-20, and Table 2, examples 1-8 and comparative examples 1-6. The instant specification discloses that when the toner particles have a surface roughness Ra of less than 1 nm, the toner is "not frictionally charged well." When the surface roughness Ra is greater than 30 nm, the fluidity and transferability of the toner deteriorates. Instant specification, page 8, lines 1-8, and Table 2, comparative examples 1 and 2. In comparative examples 1 and 2, the toners exhibited poor cleanability and charge stability or poor transferability. The specification also discloses that when the standard deviation of the surface

roughness, RMS, is less than 10 nm, the toner is "not frictionally charged well." When the RMS is greater than 90 nm, the fluidity of the toner deteriorates. Instant specification, page 8, lines 9-17, and Table 2, comparative examples 3, 4, and 6. In comparative samples 3, 4, and 6, the toners exhibited poor cleanability, and/or poor charge stability, or poor transferability. The specification further discloses that when the number of the convexity is less than 1 piece per 1 μm, the toner is "not frictionally charged well." When the number of the convexity is greater than 20 pieces per 1 μm, the fluidity and the transferability of the toner deteriorates. Instant specification, page 8, line 18, to page 9, line 2; and Table 2, comparative example 5. The toner in comparative example 5 exhibited fair cleanability, but poor charge stability. The specification discloses that when the ratio of the surface roughness Ra to the volume average particle diameter (Dv) is less than 0.2, the toner chargeability deteriorates. When the ratio of the surface roughness Ra to the Dv is greater than 0.6, the "toner particle is strongly frictionized and tends to be spent." Specification, page 13, lines 5-12, and comparative examples 1, 2, 4, and 6. The specification discloses that when the toner particles satisfy the ratio of the surface roughness Ra to the shape factor SF-2 of 0.007 to 0.30 recited in instant

claim 6, the toner has good frictional chargeability, developability, and transferability. Specification, page 14, lines 9-13. The instant specification shows that when toners have the surface properties recited in instant claims 1, 5, and 6, the toners exhibit: (1) very good to fair cleanability; (2) very good to fair transferability; and (3) good to fair charge stability. Table 2, examples 1, 2, and 4.

As discussed above, the Emoto toner meets the compositional and physical limitations, i.e., Dv, ratio Dv/Dn, and shape factor SF-2, recited in instant claims 1, 4, 6, and 9. Emoto discloses that its toner provides high quality images having good reproducibility of a microdot image. The toner has highly reliable cleanability, good transferability, and good chargeability. Paragraphs 0011-0014. The toner in example 2 also exhibits good charge stability, powder fluidity, cleanability, and transferability. Tables 2 and 3, example 2. These are the properties sought by applicants. Accordingly, because the Emoto toner in example 2 meets the compositional and physical limitations recited in the instant claims and because the Emoto toner appears to have the toner properties sought by applicants, it is reasonable to presume that the Emoto toner in example 2 has the surface roughness Ra properties and the other surface properties recited in instant claims 1, 5, and 6. The

burden is on applicants to prove otherwise. Fitzgerald, supra.

Instant claim 14 is written in product-by-process format. Emoto does not disclose that its toner particles are obtained by the process step recited in instant claim 14. However, as discussed above, the Emoto toner particles meet the compositional limitations recited in instant claim 14 and are obtained by a process that meets the process step recited in instant claim 7, from which claim 14 depends. The Emoto toner also appears to have the surface properties recited in instant claim 1, from which claim 14 depends. Thus, the Emoto toner particles appear to be the same or substantially the same as the toner particles recited in instant claim 14 obtained by process step recited that claim. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983); In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985); MPEP 2113.

19. Claims 1, 7, 9, 14, and 15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Japanese patent 09-197716 (JP'716), as evidenced by applicants' admissions page 4, lines 16-20, page 8, line 9, to page 9, line 2, and Table 2, examples 1-8 and comparative examples 1-6 (collectively,

"applicants' admissions III"). See the Japanese Patent Office (JPO) machine-assisted translation for cites.

JP'716 discloses a toner that comprises toner particles comprising a binder resin, a colorant, a paraffin wax as a releasing agent, and a colorant. The toner particles also comprise inorganic particles hydrophobic silica on the surface of toner particles with a surface coverage of 18%. Translation, example 2 in paragraph 0026. The toner particles have a surface roughness Ra of 15 nm, which is within the range of 1 to 30 nm recited in instant claim 1. JP further discloses that the toner can be used in a two-component developer comprising a carrier or as a one-component developer. Translation, paragraph 0024 and 0029.

JP'716 does not explicitly disclose that its toner has the standard deviation of the surface roughness Ra and the other surface characteristics recited in instant claim 1. However, the instant specification discloses that when the toner particles have the surface roughness Ra and the other surface characteristics, i.e., the convexity density, recited in instant claim 1, the toner has good chargeability, developability, and transferability. Instant specification, page 4, lines 16-20, and Table 2, examples 1-8 and comparative examples 1-6. The specification also discloses that when the standard deviation of

the surface roughness, RMS, is less than 10 nm, the toner is "not frictionally charged well." When the RMS is greater than 90 nm, the fluidity of the toner deteriorates. Instant specification, page 8, lines 9-17, and Table 2, comparative examples 3, 4, and 6. In comparative samples 3, 4, and 6, the toners exhibited poor cleanability, and/or poor charge stability, or poor transferability. The specification further discloses that when the number of the convexity is less than 1 piece per 1 μm, the toner is "not frictionally charged well." When the number of the convexity is greater than 20 pieces per 1 μm, the fluidity and the transferability of the toner deteriorates. Instant specification, page 8, line 18, to page 9, line 2; and Table 2, comparative example 5. The toner in comparative example 5 exhibited fair cleanability and transferability, but poor charge stability. The instant specification shows that when toners have the surface properties recited in instant claim 1, the toners have very good to fair cleanability; (2) very good to fair transferability; (3) good to fair charge stability; and (4) good toner scattering properties. Table 2, example 1, 2, 4, and 7.

As discussed above, the JP'716 toner meets the surface roughness limitation recited in instant claim 1 and the compositional limitations recited in instant claims 1 and 9.

JP'716 teaches that its toner has good developability, cleaning properties, and transferring performance. The toner does not contaminate the carrier and the photoconductor. The toner has good charge stability. The toner provides images with excellent high-definition quality in thin-line repeatability without image defects. Translation, paragraphs 0009 and 0032, and Table 1 at page 7, example 2. These are the properties sought by applicants. Accordingly, because the JP'716 toner in example 2 has a surface roughness Ra that is within the roughness range recited in the instant claims, and because the JP'716 toner appears to have the toner properties sought by applicants, it is reasonable to presume that the JP'716 toner in example 2 has the standard deviation of the surface roughness Ra and the other surface properties recited in instant claim 1. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Instant claim 7 and 14 are written in product-by-process format. JP'716 does not disclose that its toner particles are obtained by the process step recited in instant claims 7 and 14. However, as discussed above, the JP'716 toner particles meet the compositional limitations recited in instant claims 7 and 14. The JP'716 toner has a surface roughness Ra that is within the surface roughness range recited in instant claim 1, from which claims 7 and 14 depend. The JP'716 toner also appears to have

the other surface properties recited in instant claim 1. Thus, the JP'716 toner particles appear to be the same or substantially the same as the toner particles recited in instant claims 7 and 14 obtained by process steps recited those claims. The burden is on applicants to prove otherwise. Marosi; Thorpe; and MPEP 2113.

20. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'716, as evidenced by applicants' admissions III, combined with US 6,080,519 (Ishiyama) and US 5,547,802 (Kawase). See the JPO translation of JP'716 for cites.

JP'716, as evidenced by applicants' admissions III, discloses a toner as described in paragraph 19 above, which is incorporated herein by reference.

JP'716 does not disclose that the toner particles have a volume average diameter or a ratio of volume-average particle diameter to number-average diameter as recited in instant claim 4.

Ishiyama teaches that when the volume average particle size of the toner is less than 2 μm, the charge property of the toner is insufficient and lowers the developing property (i.e., developing quality). If the volume average particle size is

greater than 9 μm, the resolution of the image is degraded. Col. 7, lines 22-27. The range of 2 to 9 μm overlaps the range of 2.0 to 6.0 μm recited in instant claim 4. Thus, the toner art recognizes the volume average particle size as result a result-effective variable, the variation of which is presumably within the skill of the person having ordinary skill in the art.

Kawase discloses that in order to obtain images with excellent dot reproduction and sharpness, it is preferable that the volume mean diameter (Dv) of the toner particles be in the range of 3 to 9 μm, and that the ratio (Dv/Dp) of the volume mean particle diameter (Dv) to the number-average particle (Dp), be in the range of 1.00 to 1.15. Col. 18, lines 50-54. The volume mean diameter of 3 to 9 μm overlaps the range of 2 to 7 μm recited in instant claim 4. The ratio Dv/Dp of 1.00 to 1.15 meets the range of between "1.00 and 1.40" recited in instant claim 4.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Ishiyama and Kawase, to adjust, through routine experimentation, the particle size of the toner particles disclosed by JP'716, such that the resultant toner has a volume average particle size and a ratio Dv/Dp that are within the scope of instant claim 4. That person would have had a reasonable expectation of successfully

obtaining a toner that images with improved dot production and sharpness.

21. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/00118366 A1 (Nukada) combined with JP'716, as evidenced by applicants' admissions III. See the JPO translation of JP'716 for cites.

Nukada discloses an imaging apparatus that comprises an a particular photoreceptor **10**, i.e., a latent image bearer; a contact charging device **11**; a laser exposing optical system **12**; i.e., an irradiator; a developing unit **13**, a transfer unit **14**; a fixing roll unit **16**; and a cleaning unit **15** comprising a cleaning blade. Fig. 7, and paragraphs 0112-0113. Nukada discloses that the developing unit may be a unit in which development is conducted with a two-component developer that comprises a toner and carrier or with a one-component developer. Paragraph 0110, lines 1-12.

Nukada does not disclose the use of a developer as recited in instant claims 17 and 18.

JP'716, as evidenced by applicants' admissions III, discloses a toner as described in paragraph 19, supra, which is incorporated herein by reference. As discussed in paragraph 19 above, JP'716 teaches that the toner can be used in a two-

component developer comprising a carrier or in a one-component developer. The JP'716 toner appears to meet the surface characteristic limitations recited in instant claims 17 and 18. According to JP'716, the toner has good developability, cleaning properties, and transferring performance. The toner does not contaminate the carrier and the photoconductor. The toner has good charge stability. The toner provides images with excellent high-definition quality in thin-line repeatability without image defects. Translation, paragraphs 0009 and 0032, and Table 1 at page 7, example 2.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'716, to use the JP'716 toner in example 2 in the developer in the image forming apparatus disclosed by Nukada. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides toner images with excellent high-definition quality in thin-line repeatability without image defects.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be

reached on (571) 272-1385. The central fax phone number is (571) 273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD
Nov. 9, 2005

JANIS L. DOTE
PRIMARY EXAMINER
GROUP ~~1500~~ 1700